Author’s response to reviews

Title: Prevalence of diabetes and impaired fasting glucose among residents in Three Gorges Reservoir Region, China

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Author’s response to reviews: see over
Dear Dr Rita Aguirre

Thank you very much for giving us an opportunity to revise our manuscript. We appreciate editors and reviewers very much for their positive and constructive comments and suggestions on our manuscript entitled “Prevalence of diabetes and impaired fasting glucose among residents in Three Gorges Reservoir Region, China”, which we wish to be considered for publication in BMC Public Health.

We thank the reviewers for their reviewing the manuscript, and for their excellent and inspiring suggestions regarding our manuscript. To better understand and response to the reviewer’s comments, all authors were summoned for a meeting and agreed response draft was reached. We feel that those comments are very valuable and very helpful for revising and improving our paper, as well as an important guiding significance to our study. We have read the comments carefully and have made correction which we hope will be met with approval. The main corrections in the paper and the responses to the reviewer’s comments are shown as following. We sincerely hope that our response satisfies the reviewers and the editors.

Neither the entire paper nor any part of its content has been published or has been accepted elsewhere. We state that all of the authors have read and approved the version submitted.

Thank you and best regards.

Yours sincerely,

Hongyan Xiong

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Author's response to reviewers
Reviewer #1

1. Abstract

Comment 1: *This needs to be shortened considerably. Please do not provide the geographic details in a scientific article.*

Response: According to the suggestion, in our revised manuscript, the geographic details were deleted in the abstract. (Page 2, paragraph 1)

Comment 2: *More details of the results should be provided. There is no need for crude prevalence rates here, please mention the age-adjusted rates only.*

Response: According to the suggestion, in our revised manuscript, the prevalence of diabetes and impaired fasting glucose for the overall population and subgroups according to age and gender were added in the abstract and the crude prevalence rates were deleted. (Page 2, paragraph 3)

2. Introduction

Comment 3: *This is a very long piece. The initial paragraphs are not required and should be deleted.*

Response: In response to the suggestion, the initial paragraphs were shortened in our revised manuscript. (Page 4, paragraph 1-2)

Comment 4: *The aims and objectives of the study should be spelled out clearly.*

Response: According to the suggestion, the *aims and objectives* of the study have been added in the last part of the introduction in the revised manuscript. (Page 4, paragraph 3)
3. Methods

Comment 5: Sampling methods should be described in better details.

Response: In our study, a multistage sampling method was used. According to the suggestion, more detailed sampling method was described in our revised manuscript. (Page 5, paragraph 3)

Comment 6: You have used overweight and obesity criteria different from international obesity task force. I believe that you should not use the Chinese criteria and stick to the IOTF criteria of >25 and >30 kg/m².

Response: According to the suggestion, using the IOTF criteria might be better than the Chinese criteria, thus, in our revised manuscript, overweight was defined as a body-mass index $\geq 25$kg/m² and < 30kg/m² and obesity was defined as a body-mass index $\geq 30$ kg/m² (Page 6, paragraph 2). We reanalyzed the results related to BMI accordingly. The prevalence of overweight and obesity changed from 28.8% and 8.9% to 26.6% and 5.8%, and minor changes were observed in univariate analyses and multivariate logistic-regression analyses.

Comment 7: Method for estimation of blood glucose should be mentioned.

Response: In our original manuscript, the laboratory measurements for estimation of blood glucose were presented in the Data collection part (Page 7, paragraph 2)

Comment 8: Statistical analyses methods should be provided. How was age-adjustment performed and what was the standard age group?

Response: According to the suggestion, in our revised manuscript, more detailed analyses methods were provided in the statistical analysis part (Page 8, paragraph 3-4). The age-standardized prevalence was calculated by the direct method and the standard
age group was the population distribution in China in 2010, based on Chinese census data 2010.

**Comment 9:** Similarly details of logistic regression should be provided in greater details.

**Response:** According to the suggestion, more detailed statistical analyses method was also presented in our revised manuscript. (Page 8, paragraph 4)

### 4. Results

**Comment 10:** In Table 1 please provide numbers and not the percent only. Use only one decimal numbers and not two as you have used.

**Response:** According to the suggestion, in our revised manuscript, both the numbers and percentages were provided in Table 1 and only one decimal number was presented. (Page 23-24)

**Comment 11:** For prevalence rates, it would be helpful if you provide 95% confidence intervals.

**Response:** According to the suggestion, in our revised manuscript, 95% confidence intervals were added. The crude prevalence of diabetes and IFG were 8.4% (95% CI, 7.5% - 9.3%) and 9.8 % (95% CI, 8.6% - 11.0%), respectively. After standardization of age, based on China’s 2010 census data, the prevalence was 7.6% (95% CI, 6.9% - 8.3%) for diabetes and was 9.0% (95% CI, 7.9% - 10.1%) for IFG. (Page 9, paragraph 2)

**Comment 12:** You have reported a few risk factors significant on univariate analyses.
Please provide the odds ratios for these univariate analyses.

Response: According to the suggestion, we provided the results of univariate analysis in our revised manuscript (Table 2). (Page 25)

Comment 13: What all variables were used in the multivariate analyses? Please clarify.

Response: In our revised manuscript, both pre-determined core risk factors of diabetes (age, obesity, family history of diabetes, dietary) and the significant factors in univariable model were used in the multivariate analyses. According to another reviewer's suggestion (Duong Tran), in univariable model, $P < 0.2$ not $P < 0.05$ was used to decide whether or not to include in the multivariable model.

Comment 14: The Table 3 is very complex. Please confine your presentation to major factors. Age is an important risk factor (Table 2) and should not be repeated here.

Response: Age is one of the potential risk factor of diabetes. Thus, it should be used in the multivariate analyses. According to the suggestion, considering the overlap information of Table 2 and Table 3 in the original manuscript, Table 2 was deleted. In our revised manuscript, we modified Table 3 to make it clearer. (Page 26)

5. Discussion

Comment 15: The first paragraph of the discussion section should focus only on conclusions of the study.

Response: According to the suggestion, in our revised manuscript, we modified the first paragraph of the discussion section accordingly. (Page 11, paragraph 1)
Comment 16: The language should be improved. A number of language mistakes are present. All these should be corrected.

Response: According to the suggestion, we found a professional service to edit the language of our revised manuscript.
Reviewer #2

1. Abstract

Comment 1: *Reshape the background because the rational “reduced physical activity due to the loss of cultivated land and a series of psychological problems caused by resettlement, which might be regarded as contributing factors in development of diabetes” does not appear the focus of this research paper.*

Response: According to the suggestion, in our revised manuscript, the abstract was modified accordingly. (Page 2, paragraph 1)

Comment 2: *Line5, Insert Three Gorges Reservoir Region before TGRR.*

Response: According to the suggestion, in our revised manuscript, we corrected it. (Page 2, paragraph 1, marked in red)

2. Background

Comment 3: *In Para 1, line 5: correct spelling error: peoples*

Response: According to another reviewer’ comment (Rajeev Gupta), in our revised manuscript, the background section was shortened and the sentence “with economic development and urbanization, great changes take place on the peoples lifestyle characterized by reduced physical activity and increased obesity” was deleted.

Comment 4: *In Para2, delete “reported in JAMA’. Last line, should read “prevalence of diabetes”*

Response: According to the suggestion, we corrected them in our revised manuscript. (Page 4, paragraph 1, marked in red)
Comment 5: In Para 3, TGRR without full names given; Line 6, should read ‘impact of the development of TGRR’; What do you mean by “government pay high attention to residents living in TGRR”, should explain further.

Response: According to the suggestion, we corrected them in our revised manuscript. (Page 4, paragraph 2, marked in red).

Due to its unprecedented magnitude and significant environmental and social changes, the Three Gorge Dam has been controversial ever since its implementation. China government has invested a large amount of money to Three Gorges Reservoir Region for the environmental management and disease surveillance. Thus, in our original manuscript, we mentioned “government pay high attention to residents living in TGRR”, but it seems unclear. In order to make it more scientific and reasonable, “considering the unprecedented magnitude and an uncertain impact of the development of TGRR, it is worthwhile to examine the health profile of residents in TGRR” was substitute for it in our revised manuscript.

Comment 6: It is worthwhile to include brief implication of the research study in this section.

Response: According to the suggestion, in our revised manuscript, the brief implication of the research study was presented in the last part of the background (Page 4, paragraph 3, marked in red)

3. Methods

Comment 7: - Study population

§ Conflicting information about rate of diabetes in China in 2010. The authors reported 9.7% in this section but 11.6% in the background and discussion.
Response: The national survey in 2007 (using 1999 World Health Organization criteria) reported that the prevalence of diabetes was 9.7% in China, and the result was published in 2010. The 2010 national survey (using 2010 ADA criteria) reported that the prevalence was 11.6% in China, and the result was published in 2013. Because the 1999 World Health Organization criteria was used in our study, thus 9.7% was used to estimate the sample size. In our revised manuscript, “the rate of China in 2007 (9.7%)” was substituted for the “the rate of China reported in 2010(9.7%)”. (Page 5, paragraph 1, marked in red)

Comment 8: Para 2, line 7. I don’t understand the text “neighbor with similar age (≤ 5 year old)”.

Response: In our original manuscript, “neighbor with similar age (≤ 5 year old)” refer to the replacement participant was selected from the same villages or communities with similar age. In order to make it more clearly, in our revised manuscript, more detailed description was presented (Page 5, paragraph 3, marked in red)

Comment 9: Questionnaire interview  What is RMB?

Response: The renminbi is the official currency of the People’s Republic of China, The currency is often abbreviated RMB.

Comment 10: Physical examination

Are central obesity measures specific for Chinese population?

Response: The central obesity measures were not specific for Chinese population; it was measured and defined based on World Health Organization; we added a reference
in our revised manuscript. (Reference 10)

**Comment 11:** *Don’t understand “or as diagnosed hypertension in licensed medical facilities.”* Do you mean that you look up their diagnoses in their clinical files?*

**Response:** In our study, previously diagnosed hypertension was identified by a positive response from the participant to the question, “Has a doctor ever told you that you have hypertension?” we added it in our revised manuscript. (Page 7, paragraph 1, marked in red)

**Comment 12:** *Statistical analysis*

*What groups are they? Should indicate here that analyses are gender-specific*

**Response:** As the reviewer mentioned, the analyses were gender-specific. Thus, we added it in our revised manuscript. (Page 8, paragraph 4, marked in red)

**Comment 13:** *Although a number of factors have already been known as core risk factors of diabetes (age, obesity, family history of diabetes, dietary), the analyses presented in this paper seem to be exploratory. Why don’t you keep pre-determined core risk factors of diabetes in the multivariable models and examine the effects of other variables while controlling for the core variables (regardless their p-value). P-value >5% in your data does not mean that the variable is not a risk factor at all. In univariable model, should use p<0.2 not P<0.05 to decide whether or not to include the variable in the multivariable model.*

**Response:** According to the suggestion, in our revised manuscript, pre-determined core risk factors of diabetes and all the significant factors in univariable model were used in the multivariate analyses. In univariable model, $P<0.2$ was used to decide
whether or not to include in the multivariable model. In our revised manuscript, the multivariate logistic-regression result was reanalyzed and presented. (Page 26)

4. Results

Comment 14: Table 1

§ The sign % is included for only some applicable variables

§ In the footnote: proportion percentage is the same thing here

Response: According to the suggestion, we corrected Table 1 in our revised manuscript. (Page 23-24)

Comment 15: Table 2 and Figure 1 present the same information

Response: According to the comment, we deleted Table 2 in our revised manuscript.

Comment 16: § Table 2: Correct spelling ‘diebets’

Response: For the foregoing reasons, Table 2 was deleted in our revised manuscript.

Comment 17: § Para after Table 1 is hard to understand. Should not use the word ‘trend’ in this study. Trend over time? Should use relationship, association instead

Response: We think the Table 1 here may refer to Table 2 in our original manuscript. Considering Table 2 has already been deleted and this paragraph was not the focus of our paper. Thus, we decided to delete it in our revised manuscript.

Comment 18: § Incorrect to present % for ratios

Response: For the foregoing reason, Table 2 was deleted in our revised manuscript.
Comment 19: Table 3

§ Indicate which category is the reference for variables family history, central obesity, hypertension

Response: According to the suggestion, in our revised manuscript, the references for variables family history, central obesity and hypertension were added in the footnote of Table 3. (Page 26)

Comment 20: § Correct spelling in footnote: should be odds ratio?

Response: In response to the above comment, we corrected it in our revised manuscript. (Page 26, marked in red)

5. Discussion

Comment 21: Overall, there seems a lack of in-depth interpretations and critiques of results which leads to fairly superficial discussion and recommendations.

- What are the differences between this and other studies that could explain the differences in prevalence of diabetes?

- Findings about the predictors of diabetes in this study are not completely new to literature. In Asian population, central obesity is more likely to indicate diabetes risk than BMI. Should consider the overall effects of socio-economic status among TGRR residents.

- It might be a good idea to compare this study sample with general population in TGRR (using Census data) to determine the study sample’s representativeness other than speculating “not necessarily representative”

Response: Agreeing with the suggestions, we made major modification to the discussion part.
The differences in the prevalence of diabetes between this study and other studies may be due to differences in environment and lifestyle. After the construction of the Three Gorge Dam, great changes took place on the residents’ lifestyle characterized by reduced physical activity due to the loss of arable land and a series of psychological problems caused by resettlement, which might be regarded as contributing factors in the development of diabetes.

Just as the reviewer mentioned, central obesity is more likely to indicate diabetes risk than BMI in Asian population. In this study, generalized obesity is significantly associated with diabetes in univariate analysis but failed to reach statistical significance in multivariable analysis, whereas central obesity showed a strong association of diabetes.

In addition, low education level also appeared to be a risk factor for diabetes in this study population and the education level of residents in TGRR was very low, with half of the participants having less than junior middle school education. Educational level is a good indicator of socio-economic status. Therefore, this result means that the low socio-economic status among TGRR residents might be an important influence factor for diabetes.

Finally, we found that the investigated population was older than the general population (2010 census data of China). Thus, the age-adjusted prevalence of diabetes was lower than the crude prevalence. We added it as a limitation in our revised manuscript.

We sincerely hope that our response will be met with your approval.

Thank you and best regards.

Yours sincerely,

Hongyan Xiong